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AUTHOR Simpson, Richard L.
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ABSTRACT

This paper presents a model for school psychologists to instruct parents in behavior modification procedures for use with their children. This model, designed for use by individuals who have a basic working knowledge of operant conditioning and applied behavior analysis procedures, consists of three training sessions which are outlined with procedural steps and specific activities. A sample plan sheet is provided which includes descriptions of: (1) the program; (2) the target behavior; (3) procedures prior to observation of target behavior; and (4) consequences to be applied when target behavior occurs. The use of modeling, demonstration, and monitoring techniques by trainers is recommended to aid parents in implementing procedures. Examples of specific situations in which behavior modification techniques can be used by parents to change their children's behavior are provided. Research is described which attempted to evaluate the influence of parent-applied treatment effects on other behaviors and across environments. The paper emphasizes that the success of the model is dependent on the skill of the school psychologist in translating behavioral tenets into functional procedures. (NRB)

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Parents as Behavioral Change Agents: New Perspectives

Richard L. Simpson
Associate Professor of Special Education
and School Psychology
University of Kansas

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Parents as Behavioral Change Agents: New Perspectives

Introduction

Ample historical and empirical documentation exists to support the contention that the parent-child relationship affects behavior (Harlow, 1958; Kauffman, 1977; Quay & Werry, 1972). Consequently, it is not surprising that professionals have attempted to influence the behavior of children through work with parents. However, until only the past few years, parents have not been provided the training by psychologists necessary to allow them to effectively apply therapeutic and educational strategies with their own children. Rather, the predominant approach used with parents was a clinical model. That is, attempts were made to facilitate the development and progress of children through counseling or therapy with parents. This position resulted in parents not only being denied access to strategies and procedures which would allow them to become members of a "therapeutic alliance" (Berkowitz & Graziano, 1972) but further made many parents the object of therapists' crafts. These procedures were, and in some instances continue to be designed to uncover factors associated with developmental and school related difficulties through an analysis of the parent-child relationship. It is also apparent that since teachers and most school personnel were not trained to provide therapy for parents, few problem solving procedures involving parents were employed in school environments. Almost without exception, parents were not perceived as a resource which could serve to augment school applied procedures.

This position has, however, undergone significant change and parents are being trained to use problem solving procedures with their own children in the natural environment. School psychologists are with ever increasing

regularity being asked to serve as the primary trainers of parents.

The Use of Behavior Modification Techniques by Parents

One of the most prominent and efficacious of the problem solving alternatives available to parents is behavior modification. This approach is based on the application of an experimental analysis strategy to specific human behaviors and on the assumption that parents should be given an opportunity to assume an active role in the intervention programs that are implemented with their children rather than being required to be passive onlookers.

The procedures associated with behavior modification are designed to focus on observable and measurable behaviors. Behavior, as used in the model, refers to any observable and external response (Sulzer & Mayer, 1972). In addition, the model is based on the assumption that the operant responses of children can be controlled through the systematic application of learning theory principles. Finally, since the model assumes that behavioral principles can be taught to parents and that "problem behaviors" represent inadequate or incorrect learning, rather than evidence of underlying pathology on the part of the parent or child, parents can be taught ways of teaching their offspring to make more appropriate and developmentally mature responses. Thus, the behavioral model, in the present context, assumes that parents will function in a structured and systematically designed training role with their own children.

The procedures associated with behavior management techniques are designed to modify the frequency, rate, duration or intensity of some specific behavior through the systematic application of learning theory principles. The selection of appropriate observable and overt behaviors is a basic concept in

behavior modification; only with the consideration of this component can appropriate evaluation techniques be applied. For example, if the parents of a child were allowed to apply behavioral principles to increase their son's actualization of potentiality, great difficulty would undoubtedly be experienced in not only obtaining agreement among independent observers on the frequency, rate, intensity or duration of the behavior, but also the effectiveness of any intervention procedure that might be applied. However, while "actualization of potential" is very difficult to define and measure, the parents could be instructed in precisely determining the number of minutes their child studied at home each evening. Only with such precision can the techniques associated with behavior modification be effectively utilized. It is significant to also note that the strategy of concentrating on overt behaviors enables the person devising a program to eliminate from consideration not only unobservable behaviors and processes, but also indirect intervention approaches. Thus, it could be argued from a behavioral position that a child's lack of social interest does not necessarily indicate a "personality problem" or other equally unobservable explanation. In addition, any intervention procedure that might be implemented would be designed to train the subject in more appropriate and useful interpersonal skills rather than to remediate a defective personality. Thus, although a child's personality might improve as a function of an intervention procedure, the intervention would be designed to directly modify some observable and measurable behavior.

Since behavioralists assume that observable environmental events which precede and and follow a response are the agents responsible for the existence of the behavior and that the systematic manipulation of these factors will be

associated with predictable changes in behavior, a situation conducive to the utilization of parents as agents of change is established. That is, the procedures associated with behavior modification are of such nature that parents can be instructed in applying them with their own children and consequently in extending the treatment process to the natural home setting for an extended period of time. More traditional therapeutic approaches, on the other hand, focus on more unobservable variables and intervention techniques which, in addition to being difficult to evaluate, are not possible to transmit and apply by parents who have extensive contact with the individual of concern in the natural environment.

One additional benefit to the behavioral approach is the wide applicability of the technique. Even though as many as ten percent of all children and youth may be considered exceptional, this in no way should be interpreted to mean that the remaining ninety percent do not have problems. Obviously the parents of even the most adjusted child would acknowledge that management and structuring techniques will be needed from time to time. Consequently, because of the complexity of child development and child-rearing and because parents are not trained for their role, each will be faced with a difficult task for which they have little or no preparation. The techniques associated with applied behavior analysis and behavior modification become applicable and appealing to all parents because of the effectiveness and disseminatability of the procedures and because virtually every parent, including those with exceptional children, will find the techniques useful. In addition, behavior modification is one of the few procedures which does not automatically assume abnormality and which therefore carries the virtue of not "labeling" individuals with whom the technique is used. Since behavioral principles assume

that all maladaptive behaviors are governed by the same laws that govern adaptive behavior, no attempt is made to differentiate between "normality" and "abnormality." Rather, behaviors are evaluated relative to their own unique adaptiveness and techniques are differentially developed for behaviors deemed to be maladaptive.

Using Parents as Agents of Change

Obviously a question that must be addressed relative to the use of parents as planned facilitators of change, regardless of the technology employed or the orientation favored, is the rationale for such a procedure. Since parents have historically not been involved as agents of therapeutic change with their own children, the issue of a rationale for such a process must be provided. One justification for the use of parents as agents of change is related to the paramount role they play in child development. As noted previously, parents are the most significant influence in a child's life, especially during the formative years. Since a relationship has been demonstrated for the influence of parents on their child's development, it is obvious that techniques for training parents to be more effective would be important. O'Dell (1974) suggested that there are not only numerous benefits to utilizing parents as a legitimate resource, but that parents should specifically be trained to use a learning theory approach. O'Dell noted a number of advantages to this strategy: (1) Behavior modification techniques can be transmitted to individuals with little or no knowledge of traditional therapeutic procedures; (2) Behavior modification is an orderly and empirically based model; (3) Groups of individuals can be trained in the technology of behavior modification simultaneously; (4) Individuals can be trained to use the procedures in a relatively short period of time; (5) The procedures allow for the

maximum use of professional staff talent; (6) The model does not assume "sickness" as the basis for the problem; (7) A majority of childhood behavior problems are responsive to the approach; and (8) A behavioral approach allows for treatment in the natural environment by the individuals who routinely experience the problem. As a further argument for the development of parent implemented behavioral programs, O'Dell suggested

> parent training is vitally important if effective preventive mental health programs hope to meet the demand for professional services. Also, parent training follows the growing trend toward working in the natural environment and behavior modification offers a relatively easily learned and empirically derived set of concepts for such a parent training model. (p. 419)

Williams (1959) was among the first to report the use of a simple extinction procedure by parents to eliminate bedtime tantruming in a 21 month old child. Williams reported that the parents were able to achieve cessation of bedtime crying in a relatively short period of time and that the problem behavior did not reappear at a later date. Although not extraordinary in its methodology or results, this study demonstrated that parents could be taught to effectively utilize behavior modification procedures in a natural environment. Thus, in essence, this study initiated a new era of parent participation in the training of their own children. Since the time of Williams' study there have been innumerable other research reports that have unequivocally demonstrated the efficacy of employing parents as behavioral change agents (Bernal, Williams, Miller & Reagor, 1972; Christophersen, Arnold, Hill & Quilitch, 1972).

Even though the principles of behavior modification have been empirically derived and the technology has been found to be highly efficacious, even

when applied by parents in the home environment, the ultimate success of the procedures will be a function of the skill of the individuals using them. Ultimately, even the most efficient and well planned parent strategy must be correctly implemented if it is to produce change. As a means of isolating factors that may be correlated with the successful application of behavior modification techniques by parents, several researchers have attempted to evaluate the characteristics of the individuals with whom they have worked. Mira (1970) failed to find a relationship between the intellectual abilities, education, and socioeconomic status of parents and their ability to employ behavior modification procedures. However, Mira used a direct teaching format rather than a lecture or reading approach. Others (Patterson, Cobb & Ray, 1972) have suggested that lower socioeconomic parents lacking formal educational training are difficult to instruct and that families lacking integration and cooperation and individuals evidencing psychopathology are poor candidates for the role of therapeutic intervener (Bernal, Williams, Miller & Reagor, 1972; Patterson, 1965).

Although problems and issues do exist relative to the application of behavioral techniques by parents, data suggest that when appropriately trained in the use of behavior modification procedures, parents can be effective in the role of therapeutic change agent. In addition, it seems logical that when parents are trained to manage maladaptive behavior in the environment in which the response is manifested, the greatest degree of success and generalization will be realized. As suggested by Ross (1972):

> If behavior is to be modified, the modification must take place when and where the behavior manifests itself. This is rarely the therapist's consulting room, and as a consequence, behavior

> therapists working with children frequently find themselves working through the adults who are in a position to be present when the target behavior takes place, and who have control over the contingencies of reinforcement. (p. 919)

The School Psychologist as a Program Implementer

The forthcoming section presents methods and procedures for implementing parent applied behavior change programs. This methodology, presented as objectives and related activities, is applicable to problems occurring and being dealt with in home, school, other than home-school; or a combination of these settings. However, since the success of any change program will be a function of both the skill with which the various components are implemented and the motivation of the participants, careful consideration must be given the anticipated level of motivation and responsibility of those individuals involved. In particular, the model to be presented is most appropriate for problems occurring in the home environments or other settings where parents are most apt to be responsible or motivated to bring about change in their child's behavior.

Problems occurring exclusively in classroom settings are the responsibility of school personnel. While parents can be involved in better understanding and reaching solutions to these problems, the primary impetus for change must come from the school psychologist. These issues, consequently, are typically not amenable to solution via the model to be presented. Accordingly, the procedures to be discussed must be applied only when parents can be assured of assuming at least partial problem ownership (Gordon, 1970; Kroth, 1975).

The model presented provides only the basics of the technology used in training parents to be agents of change with their own children. Consequently, it should be remembered that the success of this program will not only be a

function of the skill with which the various components are implemented but also the effectiveness with which the school psychologist attends to basic counseling skills (e.g., establishes preliminary rapport, uses active listening skills, etc.). Without adequate attention to these factors the behavioral engineer cannot expect to be successful, regardless of how skillfully the technology is applied.

As noted in the procedural outline below, the development and implementation of a successful behavior management program cannot be established in a single conference session. The below listed model is time sequenced for procedural objectives and activities. In addition, this procedural model was developed under the assumption that individuals utilizing these procedures would have a basic working knowledge of operant conditioning and applied behavior analysis procedures.

Parent Applied Behavior Modification

Technology and Training Procedures

Procedural Steps in Session I	Specific Activities
Identify and operationally define the most significant problem response	List and operationally define the parents' concerns about specific problem behaviors shown by the child
	Priorate the concerns of the parents
	Identify the adaptive, positive and desirable behaviors of the child
	Select one problem behavior for modification, choosing a behavior for which success is probable
Identify those environments and situations in which the target behavior most frequently occurs	Determine the individuals, situations, times and circumstances surrounding the occurrence of the problem behavior
Identify contingencies operating to support the target behavior	Determine the responses of the parents, family members and others in the environment following the emission of the target response
Train the parents to identify, observe and record the target behavior	Identify and demonstrate simple observation and recording procedures to the parents
	Aid the parents in applying these systems in order to evaluate the target behavior in the home environment
	Train parents in procedures for establishing reliability
	Make adjustments in the observation and recording systems based on feedback from the parents

Procedural Steps in Session 2	Specific Activities
Train the parents to chart and inspect the target behavior data	Train parents to use simple visual displays to chart the target behavior
	Train parents to record daily observations on the chart
	Train parents to inspect the baseline data for variability and trend
Establish intervention procedures and performance goals	The conferencer selects with the parents appropriate consequences for modifying the target behavior. Intervention procedures should be positive (if possible), practical, economical, simple, and realistic
	Establish appropriate performance expectations
	Parents are trained to apply the consequences in the home setting, employing the behavioral principles of consistency, constancy and immediacy.
	Parents are trained to continue observing, recording, charting and analyzing the target behavior after the intervention procedures have been applied
Procedural Steps in Session 3 and subsequent meetings	
Parents are shown methods of analyzing and interpreting data relative to the target behavior	Parents are aided in inspecting and analyzing the data with respect to expectation goals
Changes are made in recording, charting and intervention procedures, as needed	Program modifications are implemented, as needed
Parents are encouraged to maintain contact with the behavioral conferencer and to apply the same model with other behaviors or children	A suggested follow-up schedule is adopted for parents to use in reporting the success of the home based program
	Parents are encouraged to apply the general model techniques with other problems and children

The communication of the agreed upon experimental procedures should be provided to parents in both verbal and written form. That is, rather than simply explaining to parents what they should do in the program they should be provided a simple plan sheet which details the procedures to be followed. Then if parents forget or do not clearly understand particular segments of the verbal explanation they will have access to a written procedural plan. An example of one procedural plan sheet is shown.

Column A, "Description of the Program," is reserved for a general statement of the objectives of the project, including who will be responsible for carrying out the procedures; what times (hours) of the day the program will be in effect; where the program will be implemented (home, neighborhood, store, etc.); and the contingencies that will be involved. This component of the plan sheet is designed to provide an overview of the program, particular areas of responsibility and specifics for successfully carrying out the project.

The "Description of Target Behavior" column provides for an operational definition of the behavior. This description, of course, should be made in such a fashion as to guarantee comprehension by the parents. In addition, a brief description of the strategy to be used in measuring the target behavior should be made.

The third column, "Procedures Prior to Observation of Target Behavior," allows for a description of any responses and structuring, procedures pertinent to the program. For example, if a parent applied behavior management

program was designed to decrease tantruming at bedtime, specific instructions would be required in order for the parents to structure conditions such that the target behavior could occur. That is, the parents would need to be instructed that at a certain time each evening they should announce to their child that he should prepare for bed. These instructions, in order to be consistent with the intervention program, would need to be delivered in a systematic fashion. Likewise, if a program were established to increase compliance behavior, parents would need to be instructed in when and how to deliver commands. Although this significant program component will be closely aligned with success, it is frequently neglected. Without question, the psychologist must give careful attention to this program feature by carefully programming the parents.

The fourth column serves to describe for the parents in specific and sequential fashion, the consequences to be applied in the event the target behavior occurs. It is essential that this information be provided in a way that can be easily comprehended by the parents.

Above all else, the plan sheet should be written for the benefit of the parents, for whom it was designed. Accordingly, appropriate language should be used.

An example of a plan sheet developed for the parent of a ten-year-old boy is provided for illustrative purposes. In this study (Simpson & Sasso, 1978) an effort was made to eliminate the voluntary rumination of a severely emotionally disturbed child.

Subject and Setting

The subject for the study was a 10-year-old male who had previously been diagnosed as severely disturbed and functionally retarded, and who had been in

> programs for the handicapped since he was 2 years of age. He was described as "nonverbal, having little or no interest in establishing or maintaining appropriate social relationships and prone to engage in aggressive and self-destructive behaviors." The subject was born with a cleft lip and palate deformity, which were surgically corrected at the age of 15 months. Even though this child engaged in a number of highly deviant social behaviors, his rumination was of the greatest concern to his parent and teacher. Although the subject's mother was not able to identify the age of onset of his rumination, the behavior was described as a chronic problem, having continued since infancy. The subject's rumination most frequently took the form of vomiting previously consumed food into his mouth, holding and rechewing it for several seconds, and then reswallowing it. The regurgitation process was accomplished by quick thrusts of the stomach and abdominal muscles. Although the child most frequently held the vomitus in his mouth, resulting in a "full cheeked" appearance, he periodically would allow the regurgitated materials to flow out his mouth (Simpson & Sasso, 1978, p. 146).

The procedural plan sheet used by the above described child's mother in carrying out the intervention program is shown, Again, the necessity for preparing a written plan sheet for use by parents cannot be overemphasized. This procedure appears to be one basic way of reducing uncertainty for parents while increasing their faith in the program, thus increasing the overall probability of success.

Modeling, demonstration and monitoring techniques should also be utilized by conferencers to aid parents in implementing agreed upon procedures. Hence, as a means of augmenting the verbal and written intervention program instructions, actual demonstration or modeling should be used. Verbal and written instructions can be easily misunderstood; however, a demonstration of the actual behavior to be employed in the program or feedback on the parent's appliation of techniques is far less apt to be misinterpreted.

Procedural Plan Sheet for Parent Applied Behavioral Program

Child's Name Chuck Upps

Parent's Name Ms. Fed Upps

Date Started October, 1979

Description of Program	Description of Target Behavior	Procedures Prior to Observation of Target Behavior	Procedures Following Observation of Target Behavior
The program is designed to reduce Chuck's ruminating. The program will take place at home on a daily basis during times when Chuck is awake. Chuck's mother will carry out all procedures.	Rumination is operationally defined as vomiting food into the oral cavity or from the oral cavity. Most frequently this behavior will consist of vomiting food into the mouth and then reswallowing it. It is not necessary for the vomitus to be visible for the behavior to be recorded. Rumination will be evaluated daily at home by the mother using an interval recording procedure (same as procedure explained and used during baseline data collection).	Chuck will be told following baseline that it is not appropriate to ruminate. In addition, Mrs. Upps will maintain the meal schedule presently in effect.	When observed to be ruminating, Chuck is to be told "No, swallow it" (or "No") in a bland tone. If he fails to comply with this command, place one hand over his mouth and squeeze his cheeks, forcing him to swallow. Next, lemon juice is to be squirted into Chuck's mouth, and he is required to swallow the substance. Then Chuck is to be taken to a sink where his lips and mouth will be washed with soap and water for 30 seconds. After his mouth and lips are dried, face cream is to be massaged on his lips and mouth for 45 seconds. Following this, the child is allowed to return to his previous activity.

The importance of this process was found in the implementation of a parent applied behavior management program with a six-year-old mentally retarded boy. A behavior management program was developed in order to reduce the child's negativism. In particular, both parents had experienced marked difficulty in getting the child to obey parental requests or commands; the subject was described as "head strong" and "set in his ways." Although expressive language was not his primary mode of communication, he did use phrases such as "No-No," "I won't" and "I can't" at a high rate of frequency.

Negative behavior was operationally defined as a refusal, either verbal or non-verbal, to obey a parental request or command. An event recording procedure was employed to measure oppositional behavior daily between the hours of 2:00-4:00 p.m. and 6:30-8:30 p.m. Both observation and experimental procedures were carried out in the child's home.

Baseline data indicated the subject to display an average of 21.85 specific instances of negative behavior per day (median 23). This measure was found to be fairly stable, although slightly ascending, during the seven days of baseline.

Following baseline procedures, learning theory principles and procedures which had proved effective with other children in decreasing oppositional episodes were discussed with the parents. A two point program of experimental procedures was agreed upon, with the goal being to diminish oppositional behavior. Contingency procedures were as follows: (1) The parents were instructed to eliminate attention for oppositional behavior, while introducing contingencies for cooperative behavior; and (2) the parents were instructed to isolate the subject for 3 minutes immediately following each instance of oppositional behavior.

During the initial phases of the experimental procedures, the designer of the program received several anxious phone calls from the subject's mother; during each contact the mother appeared to be more upset and less sure of her ability to carry out the prescribed program. Supportive efforts proved to be only marginally successful. The subject was described as "uncontrollable" when attempts were made to implement the time out procedures; he was said to "kick the wall and me (mother)," "chew on his chair" and "scream" when placed in the time out room. The child's mother also stated that only by physically holding her son could the time out procedure be implemented.

The child and his mother returned to the behavioral engineer's office shortly thereafter for further instruction. Since it was apparent that specific instructions were needed, a tele-coaching device was devised whereby the mother could follow verbal instructions via a radio and ear plug which the child was unable to hear. The behavioral engineer stood on one side of a one-way mirror and specifically told the mother what to say and do, i.e., when to reinforce, ignore and implement time out procedures. Comments such as "tell him that was very good," "ignore that" and "take him to the time out room now" were representative of these comments. Following a single instruction period the mother left, commenting that she felt much more knowledgeable as to what her role "really was."

Following this training session there was a signficant decrease in the number of negative episodes. The mean number of oppositional incidents was reduced to 3 (median = 2).

According to subjective parental comments, the subject was described as much easier to live with. He was also noted to use expressive language more,

arguing against requests rather than totally refusing. This tactic, although still negative, was felt to be more sophisticated than "No."

Even though these procedures were time consuming, the benefits were obvious. While most parents will not require such graphic training, most can benefit from behavioral demonstrations and modeling procedures. The conferencer must, without exception, be assured that parents are familiar with the procedures to be followed. To do otherwise is dooming any project for failure.

As a related feature, the conferencer must play an active role in aiding parents establish acceptable program goals. Without doubt, the technology associated with applied behavior analysis can be effectively utilized to change behavior (Berkowitz & Graziano, 1972; O'Dell, 1974; Zielberger, Sampsen & Sloane, 1968); hence, as a part of training parents to apply these powerful procedures the conferencer must play a prominent role in determining that goals are acceptable. Without this safeguard, the conferencer has no ethical basis for training parents to apply experimental procedures with their children. Accordingly, the conferencer must not allow parents to indiscriminately determine that they will totally eliminate a behavior that should only be reduced. It is highly acceptable to make parents a part of their child's management program, but only when accompanied by professional monitoring considerations.

Generalization of Parent Applied Treatment Programs

While the benefits of parent applied behavioral procedures have been well documented, the generalized influence of these procedures remains undetermined, particularly with highly deviant populations. Accordingly, an attempt was made

to evaluate the influence of parent applied treatment effects on other behaviors and across environments.

Two autistic children were involved in the evaluation. At the time of the program both children were manifesting behavioral excesses, both at home and at school. These excesses consisted of patterns of hyperactivity and self-stimulatory responses, which were considered to be interfering with academic and social functioning. There was evidence of an absence of severe organic brain disease, major medical problems or severe chronic physical illness for the subjects. The children involved in the study ranged in age from 7-7 to 10-0 (mean = 8-5). Although the subjects were considered to be untestable via standard intellectual procedures, both were considered to be functioning at a moderately retarded level.

Both of the children had been in a university demonstration educational program at least one year and each was living with his parents, although both had previously been institutionalized. Each of the parents had participated in a family training program for approximately one year prior to the study. The family training program consisted of not only information and support counseling but also instruction in basic learning theory procedures.

Research Design

All overcorrection interventions were implemented within a variation of the "ABAB" experimental design. Specifically, there were two primary conditions, each of which was partitioned into two parts to allow for an examination of generalization across settings. Although the intervention procedures were systematically implemented in both the home and school environments, observations were made only in the home settings. For both subjects, the sequence of conditions was:

1. Baseline: behaviors monitored concurrently in home and school settings.
2. School only: overcorrection applied at school; no treatment at home.
3. Home only: overcorrection applied at home; reversal at school.
4. Both Settings: overcorrection re-established at school; continued at home.

Measurements on target behaviors and behavioral correlates (behaviors related to the target behavior which were observed but not provided specific intervention) were obtained in the home settings by an independent observer four days per week for a ten-week period. This observer made 30 second interval recordings for 15 minute periods. Reliability measures were taken once weekly by a second independent observer. These checks indicated reliability coefficients of at least 90% in all cases.

Target Behaviors

Subject 1 - Rumination - This deviant self-stimulatory behavior was operationally defined as the vomiting of food into or from the oral cavity.

Subject 2 - Repetitive Verbalizations - This self-stimulatory behavior consisted of vocalizations emitted outside of conversation which were not designed to directly manipulate the environment.

Behavioral Correlates

In order to study the relationship between changes in the target behaviors and other behavioral dimensions, sets of positive and negative behavioral correlates were identified and observed in the home setting for both subjects. Proximity to others and playing appropriately comprised the positive correlate category selected for both subjects. Negative behavioral correlates were face-slapping, body rocking, and thumb-sucking for subject 1, while hand-clapping, sterotyped jumping, and body-spinning were targeted for the second subject.

Overcorrection Treatments

Near the close of the initial baseline phases, overcorrection procedures specific to each child were explained and demonstrated to the participating parents. Before being allowed to implement the procedures with their children, the parents were required to demonstrate the techniques on a plastic doll and the experiments. Thereafter, assistance and further explanation were provided by the observer as needed.

Specific overcorrection procedures employed with each subject are provided below:

Subject 1 - Rumination - Restitutional overcorrection was used as treatment. When the behavior occurred, the parent/teacher would say, "No, swallow it," and require that the child swallow his vomitus. A small quantity of lemon juice was then squirted into the child's mouth and he was also required to swallow this substance. Next, the child's exterior mouth, lips, and face were washed with soap and warm water for 45 seconds. Following a brief face drying procedure, face lotion was massaged into the facial area for 30 seconds. After the overcorrection procedure was completed, the child was returned to his original activity. As always, manual guidance (Foxx, 1971) was applied in a firm manner. Moreover, all verbal commands were issued without conveying anger or frustration.

Repetitive Verbalizations

Treatment involved both restitutional overcorrection and positive practice overcorrection procedures. Four separate verbal commands were issued contingent upon the occurrence of repetitive verbalizations. They were 1) "Be quiet." 2) "What is your name?" 3) "How old are you?" and 4) "How are you?"

Command number one was held in operation for 15 seconds, while commands two, three and four were given together, covering a 15 second time period. Both command groupings were separated by a short pause so as to not confuse the child. The set of question commands was randomly presented. Since the entire procedure lasted two and one half minutes, five complete cycles of commands were applied. To measure the duration of the entire procedure, a kitchen timer was used. A neutral temperament was maintained throughout the application of the procedure.

Results

Data were analyzed individually for each subject using a one-way fixed effects analysis of variance technique (Winer, 1971). This strategy allowed for an evaluation of the effects of an individualized overcorrection procedure applied randomly at home, school or in both environments simultaneously on a self-stimulatory response monitored only at home. In addition, data on two positive adaptive behaviors and three additional self-stimulatory responses were collected on both subjects. Since no discrete intervention procedures were applied to modify these positive and negative behavioral correlates, and since observation on the various dependent measures were made only in the home environment, an analysis was possible for not only differences for the respective target behaviors as a function of the application of the overcorrection procedure, but also for generalization effects across environments and related behaviors.

As revealed in Table I, the analysis of data for the first subject showed that rumination, (operationally defined as vomiting food into or from the oral cavity), the target behavior, was significantly decreased by the overcorrection

Analysis of self-stimulatory behaviors and positive and negative behavioral correlates as a function of Overcorrection procedures applied differentially across home and school environments.

Subjects and Experimental Conditions	Mean Percent Self-Stimulatory Behaviors	Mean Percent Positive Behavioral Correlates		Mean Percent Negative Behavioral Correlates		
			Behaviors Measured			
Subject 1:	Rumination	Proximity	Playing Appropriately	Face Slapping	Rocking	Thumb Sucking
Baseline	35.75	52.00	15.75	27.50	58.25	33.25
School-intervention	10.89	47.84	5.79	6.84	28.79	28.74
Home-intervention	.43	70.43	15.29	.43	20.00	26.14
Home and School	.38	58.88	19.50	4.88	26.63	17.50
F-Ratio	4.71	1.35	1.39	11.41	4.39	.62
df	3/34	3/34	3/34	3/34	3/34	3/34
	*			*	*	
Subject 2:	Verbalizations	Proximity	Playing Appropriately	Hand Clapping	Jumping	Spinning
Baseline	78.33	30.50	.00	35.67	.00	2.17
School-intervention	83.78	21.87	11.61	18.30	14.04	4.26
Home-intervention	26.71	58.57	5.29	1.29	1.86	.00
Home and School	20.75	68.38	.38	4.50	1.63	.38
F-Ratio	47.04	9.03	1.58	8.10	5.31	1.71
df	3/40	3/40	3/40	3/40	3/40	3/40
	*	*		*	*	

* Indicates statistically significant differences.

procedures when this technique was implemented in the home, school and in the home and school simultaneously when compared with baseline rates. Although post-hoc procedures revealed that each of the experimental conditions was significantly different ($p < .05$) from the baseline rate, the procedure was most effective when implemented in the home, and both environments simultaneously.

Neither proximity nor playing appropriately, (the two positive behavioral correlates evaluated without attempts at manipulation for subject 1), were significantly influenced by the application of the overcorrection procedure for rumination in the various environments. However, two negative behavioral correlates, self-stimulatory face-slapping and rocking, were significantly decreased, when compared to baseline rates, by the application of the overcorrection procedure to the target behavior. No significant differences were revealed for self-stimulatory thumb-sucking as a function of the overcorrection treatment applied in the various environments.

An analysis of self-stimulatory verbalizations, the target behavior for subject 2, revealed significant differences ($p < .05$) between the baseline values and the home and simultaneous home and school values. In addition, significant differences ($p < .05$) existed between the percent of self-stimulatory verbalizations occurring at home when the overcorrection procedure was applied at school and at home and home and school simultaneously. As shown in Table I, subject 2 had the lowest percent of self-stimulatory responses when the overcorrection procedure was employed in the home and the home and school simultaneously.

Data analysis also revealed a significant increase ($p < .05$) in the adaptive behavior proximity when the home and simultaneous home and school overcorrection procedure for self-stimulatory verbalizations was compared with

baseline and school only overcorrection rates. Again, the highest levels of this positive behavioral correlate occurred when the overcorrection procedure was applied in the home and in both environments simultaneously. No significant differences existed for the variable playing appropriately as a function of the overcorrection procedure being applied in the various environments.

An analysis of self-stimulatory hand-clapping revealed statistically significant differences between the baseline condition value and when the overcorrection procedure for verbalizations was applied in the various environments. Again, the lowest levels of self-stimulatory hand-clapping were observed while the overcorrection procedure was being applied in the home and in the home and school simultaneously. An analysis of the negative behavioral correlate jumping data revealed significant differences ($p < .05$) in the percentage of responding when the overcorrection procedures were implemented at home and school and when comparisons were made between school and baseline and school and simultaneous home and school conditions. Although self-stimulatory jumping had frequently been observed in subject 2 prior to formal data collection procedures, this behavior did not occur during baseline phase and is thus considered to be an atypical sample. An analysis of self-stimulatory spinning did not reveal significant differences ($p \not< .05$) as a function of the overcorrection procedure applied in the various environments.

Previous research efforts (Barnard, Christophersen, Altman & Wolf, 1974) have suggested that generalization of effects across environments does not routinely occur, especially with autistic and autistic-like children. This observation has especially been true when the primary intervention techniques has been mild punishment. However, other researchers (Azrin & Holz, 1966)

have reported generalization of effects when stronger forms of punishment have been used. With regards to the present data, this pattern seemed to apply. Specifically, the procedure employed with subject 2, a mild punisher designed to reduce self-stimulatory verbalizations, did not result in significant generalizations across environments. However, the treatment for subject 1, an overcorrection procedure having as one component a lemon-juice punishment process for rumination, was associated with statistically significant differences when applied at school and not in the home. The present findings, coupled with previous observations, would seem to reinforce the inference that the strength of a punisher may be one of the most salient variables in determining generalization across environments.

The data can also be used to evaluate the relationship between a self-stimulatory target behavior and other untreated positive and negative behaviors. Although proximity for subject 2 was the only positive behavior revealing changes associated with the respective overcorrection procedures, there were changes in a majority of the other observed but untreated self-stimulatory behaviors. Specifically, data for subject 1 indicated significant reductions for the self-stimulatory behaviors face-slapping and rocking as a function of the overcorrection procedure for rumination. In both instances, data indicated the lowest rates for these self-stimulatory behaviors when the overcorrection procedure was being employed at home and home and school simulataneously. Although the differences among the various experimental phases for the behavior thumb-sucking were not statistically significant, the same pattern was observed, with lowest levels of the behavior taken when the overcorrection procedure was applied at home and home and school at the same time. Data for subject 2 was

similar to that for subject 1. Again, statistically significant differences occurred for two of the three self-stimulatory behaviors observed. In addition, data indicated that the lowest levels for both self-stimulatory hand-clapping and jumping (discounting what was considered to be an atypical baseline) occurred while the overcorrection procedure for self-stimulatory verbalizations was being implemented in the home and at home and school simultaneously. In addition, although differences for spinning were not found, the lowest rates for this monitored self-stimulatory behavior occurred while the procedure for the target behavior was being implemented in the home and home and school simultaneously.

Although the present data are far from conclusive, they do suggest potential for decelerating self-stimulatory responses in the two most significant environments for a child, home and school. That the procedures were successfully applied by classroom teachers and parents makes the potential utility of these techniques even more significant.

Summary

Behavioral principles, without doubt, can be effectively applied by parents in natural settings. However, the success of the model will be most prominently associated with the skill of the school psychologist in translating behavioral tenets into functional procedures. Consequently, the psychologist must recognize that program success (or failure) will probably not be a function of the technology; the technology works! Rather, success will be determined by the behavioral engineer's skill as a psychologist. Accordingly, the school psychologist must recognize applied behavior analysis as a tool which can only be effectively applied through effective interaction skills. Without effective

attending, listening, rapport and other basic interpersonal elements this approach will fail to accomplish the goals set forth for it.

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